GCSE
GEOGRAPHY

Getting started

Booklet 2 - Resources, Skills checklists, Fieldwork examples

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GCSE
GEOGRAPHY

Resources for Paper 3 Geographical Applications

To be issued to students 12 weeks before the date of the exam.

Specimen

This booklet contains three resources as follows:

- Figure 2 – Living in an increasingly urban world: pages 2-3
- Figure 4 – Challenges of urban growth in LICs/NEES: pages 4-5
- Figure 5 – Urban problems in Kolkata – improving the life of the urban poor: pages 6-7

Figure 2

Living in an increasingly urban world

In 1950, fewer than one in three people lived in a town or city. In 2006, the United Nations (UN) estimated that the world's population was evenly split, with 3.2 billion people living in each of urban and rural areas. It is estimated that in 2015 nearly 60% of the world's population lived in urban areas and this figure is expected to increase to approximately 70% by 2050.

Rates of urbanisation

Rates of urbanisation vary globally.

As countries change from large rural, agricultural economies to more commercial industrial economies, the population becomes increasingly concentrated in towns and cities.

- Countries that have reached high levels of economic development generally have urban populations of 75% plus.
- Countries at very low levels of economic development usually have urban populations of less than 50%.
- India, China and Nigeria are expected to account for 37% of the projected growth of the world's population. Up to 2050, India is projected to add 404 million people to its urban population.

The growth of megacities

A megacity is defined as a city that has 10 million or more people. In 1950, New York was the only global megacity. In 2014, there were 28 megacities, 21 of them in LICs/NEEs. Recent estimates suggest that the number of megacities will increase to 41 by 2030 and beyond 50 by 2050.

Ten of the world's megacities (2014)

Name	Estimated population (millions)
Tokyo	37.9
Mumbai	20.7
Lagos	21.0
Dhaka	18.2
São Paulo	21.2
Karachi	24.0
Mexico City	22.2
New York	23.6
Jakarta	30.3
Kolkata	14.7

Figure 2 continued

Why are cities in LICs/NEEs growing?

Shanghai leads China's urbanisation change

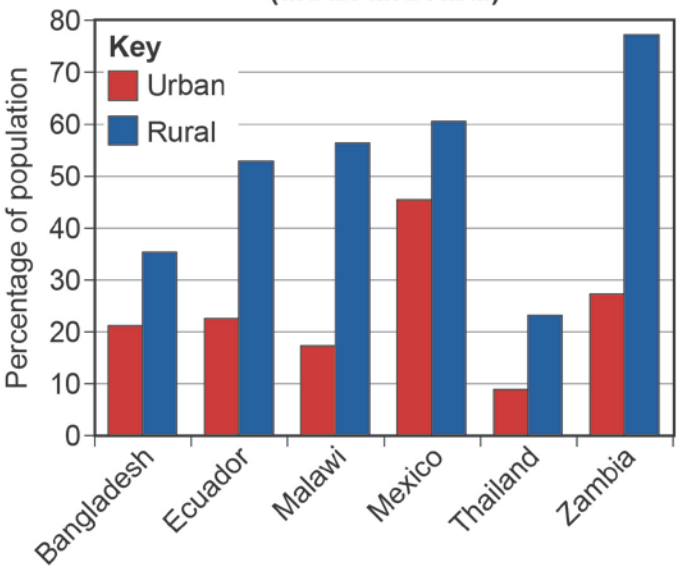
Shanghai's population has reached the 20 million mark in the past year as more than 3 million people have flocked to the city to find work. Many of these people are young and this will lead to an increase in the birth rate, pushing the city's population up even faster.

The staggering shift from the countryside to the wealthier urban centres is a common feature across the country.

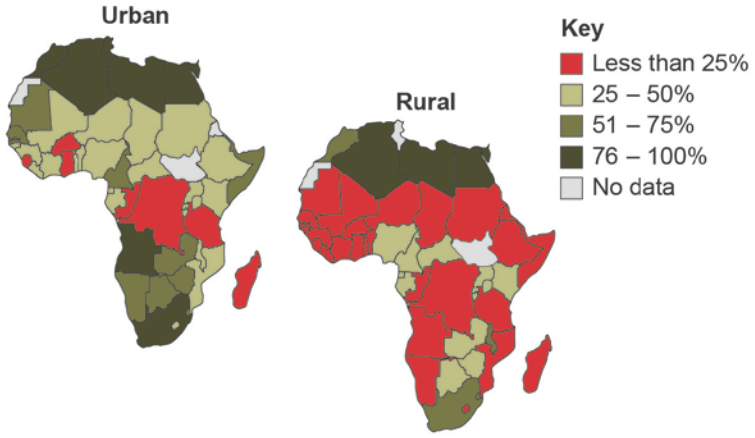
Shanghai, which is seen as the business capital of China, is drawing millions of peasant labourers to its vast construction boom and higher wages.

The millions of rural, migrant workers in Shanghai can earn much higher incomes than in their home villages where many people live on less than the equivalent of 60p a day.

Proportion of the population living below the national poverty line, 2010 estimates (urban and rural)



Use of improved sanitation facilities, 2010



Hunger fuels urban movement

José Ramirez, 31, left his farm in rural Brazil to travel to the city of São Paulo to find work. The rains had been poor and his small farm produced less food every year.

When drought destroyed the crops on the farm José's wife and children joined him in São Paulo.

"At least in the city we can find basic jobs and a place to live. I can now feed my family and the children have a home with running water and can go to school", said José.

Benefits created by urban growth

It is estimated that 80% of economic growth in LICs/NEEs occurs in urban areas. Cities create a wide range of economic and social benefits that are not always available in rural areas. This includes social services, such as education and healthcare, and access to basic facilities like clean water. Urban areas are often transfer hubs and consequently attract commercial development. Many cities in LICs/NEEs are financial centres and contain a large number of international businesses. Also, because of the growing population and increasing wealth, there is employment available in both the formal and informal sectors. These cities are often referred to as 'engines of growth' because of the way that they create socio-economic benefits and are important to the economic development of the whole country.

Figure 4

Challenges of urban growth in LICs/NEEs

The environmental cost of urban growth

The use of cheap, poor quality coal and the increase in car ownership is creating serious air pollution problems in many LIC/NEE cities. In 2010, it was estimated that fifteen of the world's dirtiest cities were in China. Rivers in many of the fastest growing cities are increasingly polluted by industrial and human waste, and coping with the growing volumes of garbage is a real problem. Vast garbage tips are found on the edge of many LIC/NEE cities, creating toxic waste dumps where all sorts of dangerous chemicals seep into water systems. In addition to this, as cities grow, more and more green space is lost.

At a recent environmental conference, one speaker said "Without effective management, the general quality of urban environments will decline – leading to poorer levels of health for the whole community."

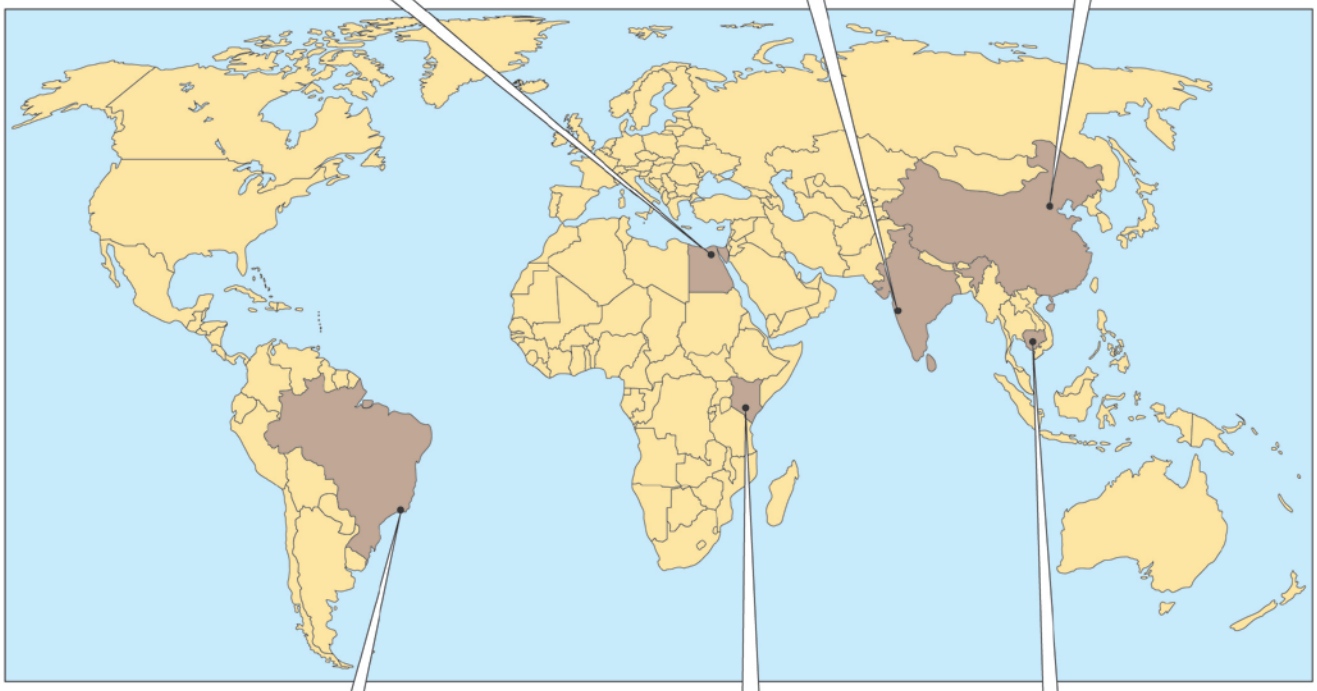
Figure 4 continued

The pressures of urban growth in LICs/NEEs

Cairo, Egypt
Slum areas are growing rapidly. Nearly 2 million people live in slums with no basic facilities.

Mumbai, India
Thousands live in decaying slums which are vulnerable to collapse in the monsoon season.

Beijing, China
Industrial development and growing levels of traffic has led to massive increases in air pollution.



Rio de Janeiro, Brazil
Over 1 million people live in slums. Drug-related crime is common and there are many murders.

Nairobi, Kenya
Nearly ¾ million people live in Kibera, a slum area with no proper sanitation. Unemployment is high and there are frequent outbreaks of violent crime.

Phnom Penh, Cambodia
Nearly 250 000 people live in shacks which are often flooded. The resulting water pollution is a big health risk.

The growth of urban slums in LICs/NEEs

United Nations study finds that nearly 1 billion people are living in slums

A recent United Nations (UN) report found that 940 million people are living in areas where they have no clean water, sanitation or legal security. The report found that urban slums are growing faster than expected and conditions in many cities are getting worse. Africa has 20% of the world's slum dwellers and South America 14%, but it is in Asia where the situation is worse – with nearly 600 million people living in slums.

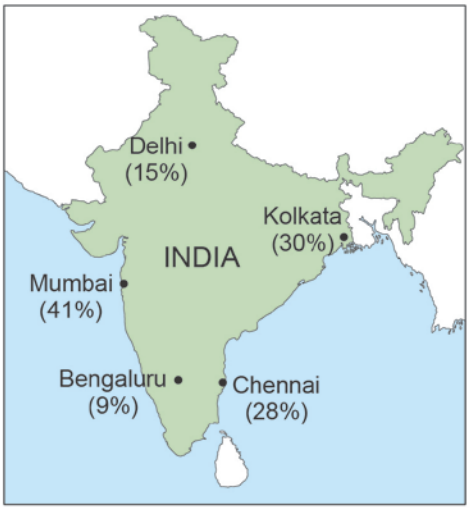
Slum population (billions)

1990	0.75
1995	0.80
2000	0.90
2005	1.00
2010	1.10
2015	1.25
2020 (est.)	1.30

Figure 5

Urban problems in Kolkata – improving the life of the urban poor

% of the population living in slums in Indian cities



Facilities in low income areas of Kolkata (%)

Facility	Low income area	Very low income area
Garbage collection	12	0
Link to sanitation system	56	28
Household water supply	0	0
Household bathroom	2	0
Access to electricity	15	0

Cyclone Komen brings flood misery

Cyclone Komen brought torrential rain yesterday, flooding large parts of the city and bringing traffic to a standstill. The situation was made worse by record high water levels in local rivers. There are reports of many areas being up to a metre deep in water and many areas have lost their water and electricity supplies. The local authority has installed temporary pumps but with continued heavy rainfall they are making little impact. If the situation continues there is a fear of growing water contamination and disease.

Kolkata – a city at bursting point

Kolkata is a sprawling metropolitan area and is home to nearly 15 million people. The city is at bursting point, with environmental threats in the air, water and soil. Air quality is a real problem and for much of the year a layer of smog sits above the city and it is reported that seven out of ten of Kolkata's residents suffer from some form of respiratory illness. The river Ganga, running through the city, is one of the most polluted rivers in the world. Factories discharge industrial waste into the river and human waste flows into smaller rivers which flow into the Ganges. In Dhapa, on the edge of the city is the city's largest landfill site. It stands nearly 30 metres high and covers an area of 25 acres. Chemical waste seeps into the ground under the site, polluting both soil and groundwater.

Natural disaster risk: Kolkata ranks seventh in global city list

Kolkata has emerged as the world's seventh riskiest city when it comes to being under threat from all types of natural disasters.

An assessment of 616 cities around the world for their risk of earthquake, cyclone, storm surge, river flooding and tsunami has found 14.7 million Kolkatans face serious risk from natural disasters. When it comes to only the threat of river floods, 10.5 million Kolkatans are at risk, but the city is also fifth in terms of tsunami risk, with more than half a million people exposed. It is also threatened by cyclones.

Kolkata is situated near Sunderbans, the world's largest delta, and is susceptible to flooding every year during the June-September rainy season. The 140-year-old drainage system in the former capital of British India is among the oldest in the country and covers less than 50% of the city. Kolkata's civic infrastructure is grossly inadequate to tackle a climate-change-triggered disaster, admit officials. Less than 5% of the city's 180 km trunk sewer lines have been desilted. The rest is clogged, making it impossible for water to drain out quickly in case of a sudden flood. With the Bay of Bengal a mere 180 km away, the city is also vulnerable to widespread destruction from storms hitting the coast.

Figure 5 continued
Addressing issues of urban poverty in Kolkata

Living conditions in the slums of Kolkata are appalling. Civic amenities such as drinking water, drainage, sanitation and electricity are non-existent or don't work properly. Most slums have a single source of drinking water – a tube well – and often that does not work. Roads are in such bad shape that the slums become inaccessible in the rains. Needless to say, there are also no schools or healthcare.

Photograph A

Photograph B

Project file

Project 1

A water-related project partly funded by an aid agency. It will repair leaks in existing water pipes and extend water supply and sanitation systems to some of the slum areas, improving housing conditions in those areas. Water treatment plants will also be built in areas of heavy industry.

Project 2

A joint government/self-help scheme which will improve housing conditions in some of the poorest areas by providing clean water and toilets. It will also provide low-cost accommodation for about 80 000 people who are living on the streets. Half a million homes and businesses will be given methane stoves, reducing the need to burn coal.

Project 3

A large-scale project funded by the World Bank which will be put in place over the next ten years. It will provide a waste-water system throughout the city, giving housing and industrial areas sanitation systems to take away sewage and polluted water. At the same time, some of the worst slums will be demolished and the area cleared so that new low-cost housing with proper services can be built in the future.

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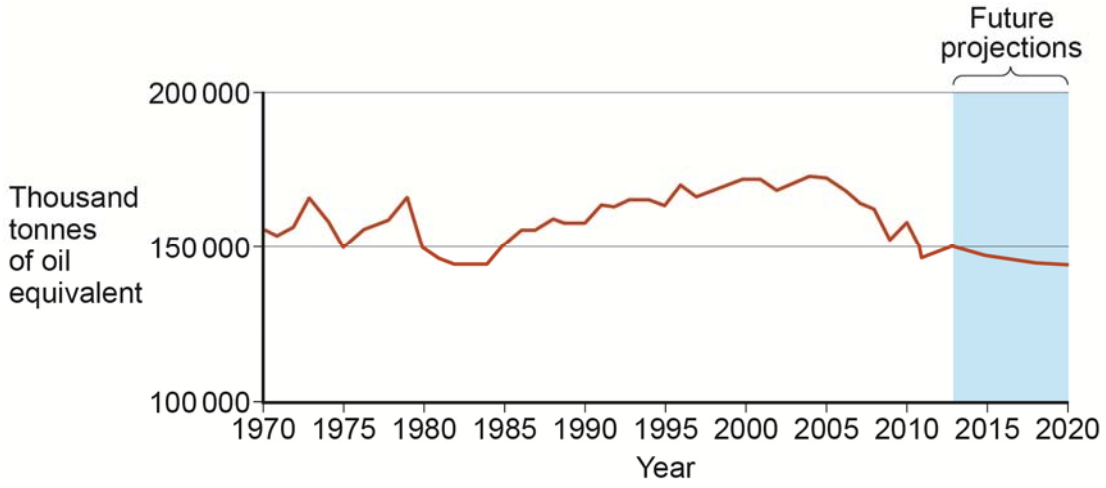
Figure 1

Energy in the United Kingdom

Energy consumption in the United Kingdom

The energy we use is fundamental to just about everything we do. Without it there would be no heating or lighting in our homes, no transportation or communication systems and very little industry.
Over the last 40 years the total energy consumption in the United Kingdom has fluctuated between approximately 140 000 and 170 000 tonnes of oil equivalent a year.

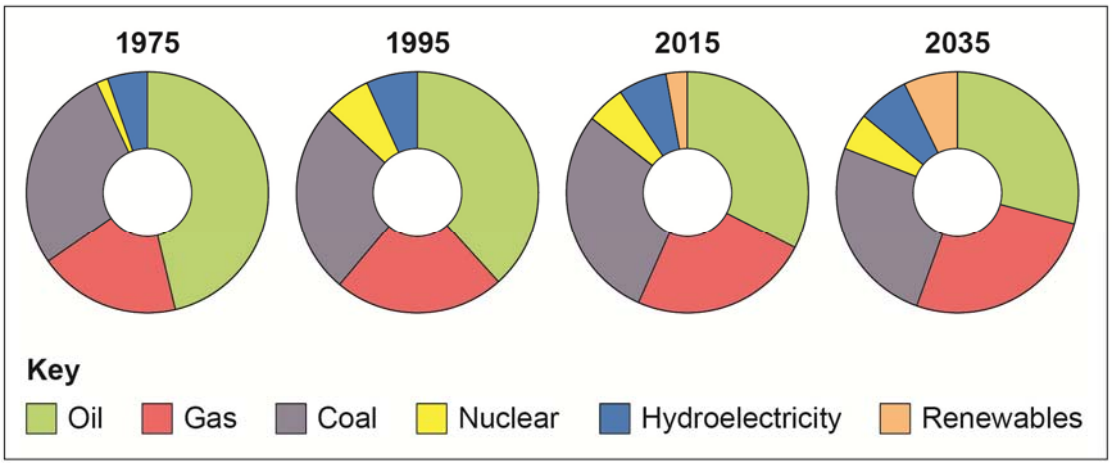
Total energy consumption (1970–2020)



The changing energy mix in the United Kingdom

The energy mix is the range of energy sources used. The resources available to a country and decision about which sources to use will determine a country's energy mix. In the United Kingdom fossil fuels have always been an important part of the energy mix because they are used in transport as well as in power stations to generate electricity.

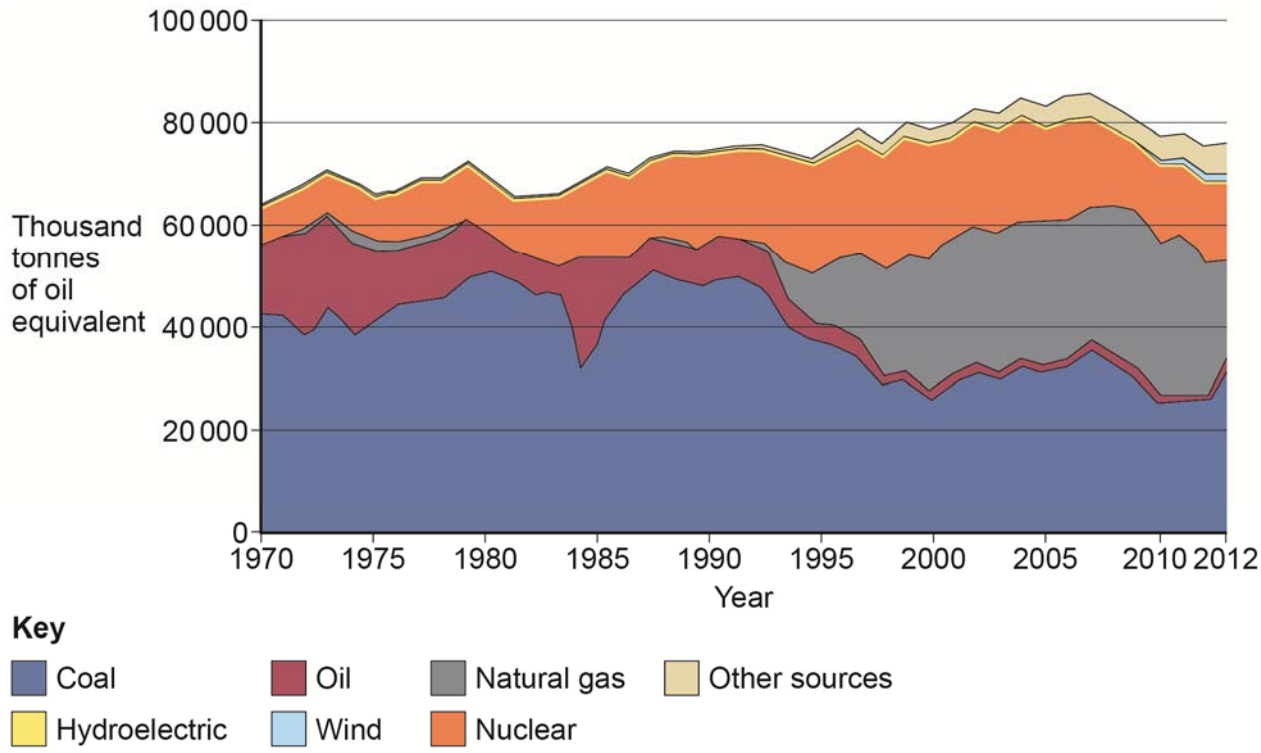
United Kingdom energy mix



The electricity energy mix in the United Kingdom

In 1970 coal accounted for about two-thirds of all electricity generation. By 2012 this figure had fallen to under a half. The fall in the use of coal was partly the result of a massive increase in the use of gas (the so-called 'dash for gas') in the 1990s when gas from the North Sea was cheaper than coal. Recent years have seen a gradual increase in the use of renewables. Renewable energy is seen as more environmentally sustainable and efficient – converting fossil fuels into electricity wastes approximately 50% of the energy stored in primary fuel. It is expected that coal-fired power stations fitted with carbon capture and storage will start producing electricity by 2020, but the increasing development of renewables will see them producing 40% of the UK electricity needs by 2030.

Sources of electricity (1970–2012)



UK energy statistics 2013 (Department of Energy and Climate Change)

- In 2013 coal accounted for 36.3% of electricity generation
- Renewable electricity generation increased to a record 15% of all electricity needs
- Production of all fossil fuels was lower than in 2012
- Energy consumption in the domestic and service sectors increased, while there were falls in the transport and industry sections
- Imports of energy resources reached a record high, with net import dependency reaching 47%

Net energy import dependency

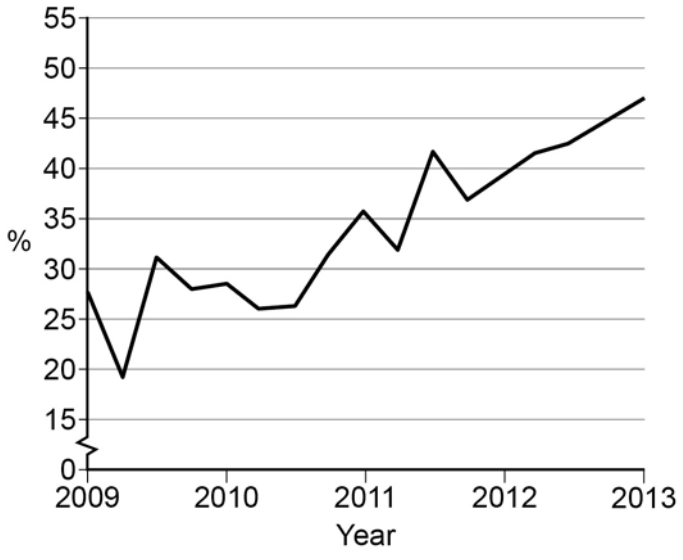
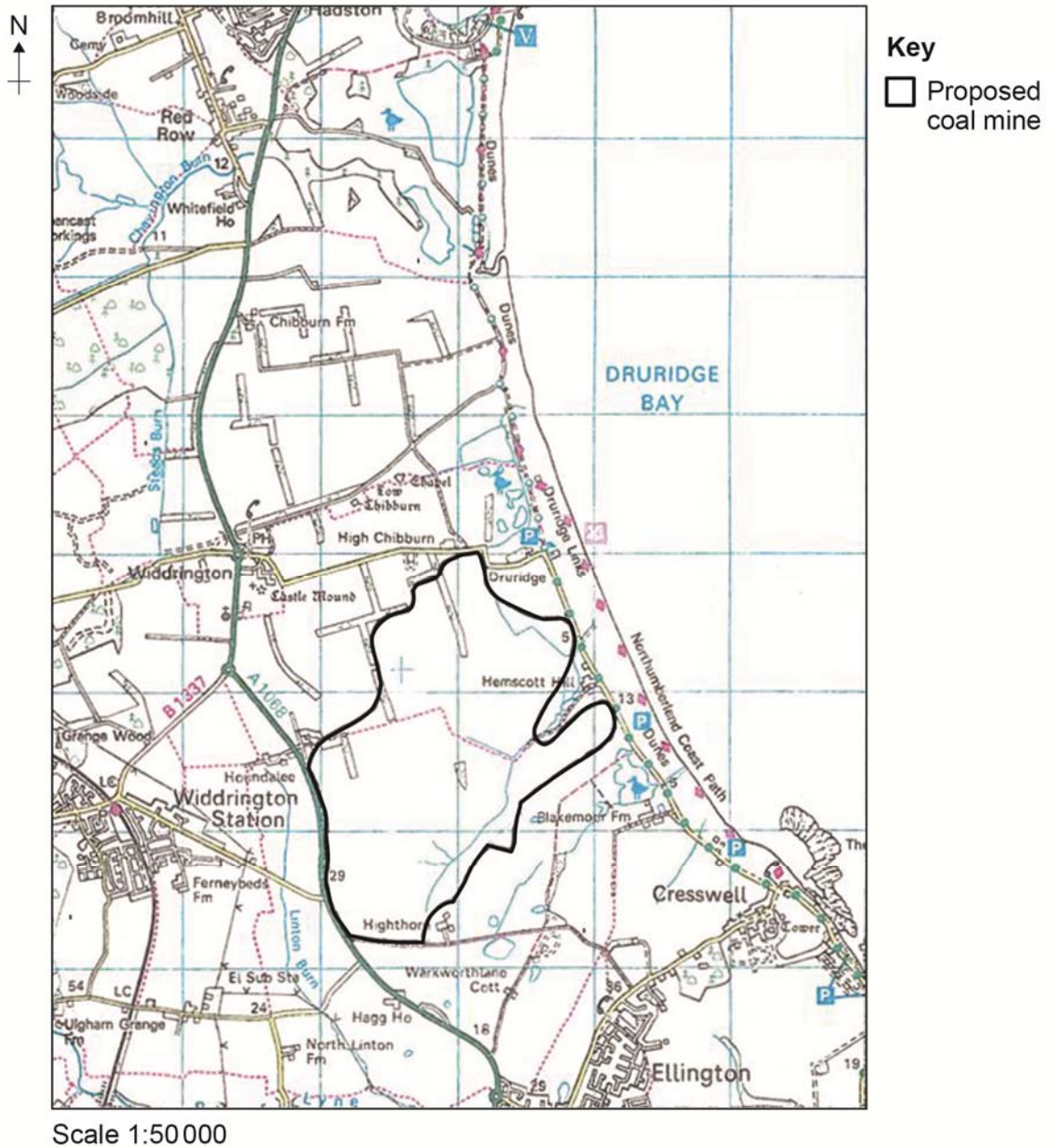


Figure 2

New surface coal mine planned for Druridge Bay

Plans for an opencast coal mine near a Northumberland beauty spot that would create or sustain more than 100 jobs have been announced. The initial proposal covered an area to the east of the A1068 from Chibburn Farm in the north to Highthorn in the south. The most recent proposal has been scaled down to the area highlighted on the Ordnance Survey extract.

It is estimated that the proposed mine will extract around 7 million tonnes of coal over a 12-year period. The development will include an area of extraction and a storage facility. Supporters of the plan say that "at present, about 70% of the coal used to generate electricity in the UK is imported and reliance on imported coal makes the UK vulnerable to supply and price variations. Coal is a vital part of the UK energy mix and is an energy source that can be stored safely and used flexibly in order to increase electricity supply at critical times of the year". The proposed area for development lies within the Northumberland coastal plain and is a largely flat area with wide sweeping sandy beaches, which are increasingly popular for recreation and tourism.



Druridge Bay

Massive opencast mine planned near Druridge Bay

Proposals have been unveiled by Banks Mining for a massive new opencast coal mine near Druridge Bay in Northumberland.

Tourism and wildlife organisations are being consulted over plans for a massive new opencast mine close to one of the region's leading coastal beauty spots. The site, known as Highthorn, lies between the villages of Ellington and Widdrington. Banks Mining says the development will create or sustain more than 150 jobs over the next decade and beyond, and make a big contribution to the economy of the area. It would be the biggest surface mining operation in Northumberland since the 14 million tonne Stobsworth site was worked by UK Coal in the 1990s.

Banks Mining is working closely with Northumberland Tourism and the Northumberland Wildlife Trust to discuss a range of tourism and nature conservation benefits from the restoration phase of the project.

The company also plans to consult widely with local residents in an area that has been affected by opencast mining for decades.

The Highthorn site is said to be one of the biggest and best remaining coal resources in England.

The development manager from Northumberland Tourism said "We are not actively supporting this opencast scheme but if planning permission is given, we would hope there will be significant tourism benefits from it".

The chair of Widdrington Parish Council, added: "When the Steadsburn site was approved a few years ago, we were told there would be no more opencast mining in this parish. I'm not really sure how people will take this one, because at 10 years it is a lengthy scheme. Druridge Bay is becoming increasingly popular for tourism. While this site would be quite well back from the beach, I'm not sure how much effect the noise will have on visitors and locals".

The company's communications manager said "We know this area extremely well and, with its proximity to the popular beach and wildlife attractions at Druridge Bay, we understand that the Highthorn proposal is a unique and sensitive location. Our planned investment has the potential to offer so much to both local people and visitors to the area".

Figure 3

Views about the development of Druridge Bay

Highthorn surface mine – Druridge Bay

The Highthorn surface mine project has the potential to attract new investment to the area.
Banks Mining has said that the development will create new jobs and deliver substantial investment into local businesses, the supply chain and the tourism economy'. Banks Mining is proposing to set up the 'Discover Druridge' project which will aim to boost tourism in the area and create new wildlife habitats.

Some of the benefits of the mining development are:

Wildlife and open spaces

- Over 100 hectares of new wetlands and wet grassland habitats will be created in and around Druridge Bay
- 7.9 km of footpaths, bridleways and cycle paths will be created
- Building of wildlife hides

Recently restored mining area

Employment and training

The development will:

- create 50 new jobs
- sustain a further 50 jobs
- fund new and improved community facilities
- support local people with training, skills and apprenticeships.

The local community

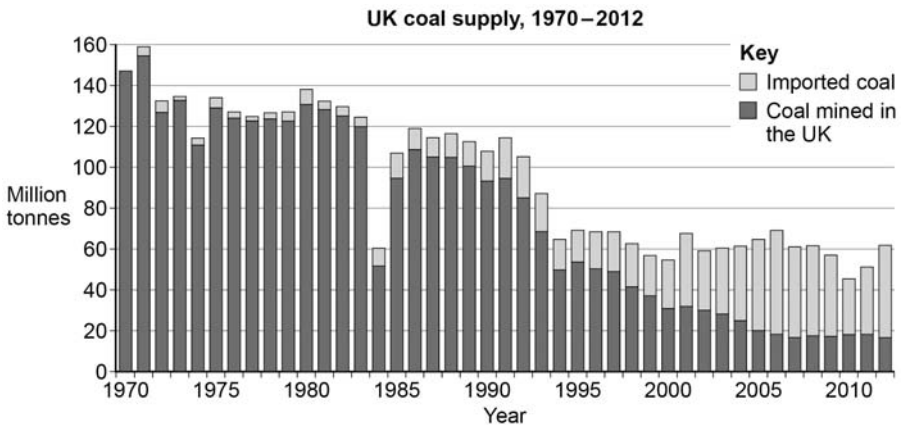
The development will create:

- a £450 000 Highthorn Community fund from a 15p per tonne contribution
- a £225 000 Skills Fund providing help with funding for protective clothing, transport to work or helping small businesses to take on apprentices
- footpaths, bridleways and cycle paths to encourage healthy lifestyles.

A spokesperson for the Parish Council said "The Discover Druridge initiative would help to give the local community what it needs and bring in more visitors. This is an area with a strong industrial history and the proposed site is well back from the beach and hidden by the undulating coastline so visitors will not be put off. Also, when the mining is completed the landscape will be fully restored".

Coal authority backs Highthorn mine development

The Coal Authority, which is sponsored by The Department of Energy and Climate Change, has stated that it supports the way in which the mining company is looking to exploit the coal in 'socially and environmentally' acceptable ways and that coal mining in the UK is critical for the supply of coal for electricity generation, making the point that relying on imported coal is a risk to energy security.



Druridge Bay – Picturesque part of Northumberland countryside at risk if mining proposals approved

A picturesque stretch of the Northumberland coast would be blighted if proposals to dig England's largest opencast coal mine are approved, locals have warned. The plans would see up to 7 million tonnes of coal excavated by 2023 on a site next to Druridge Bay, about 30 miles north of Newcastle.

Many locals are furious about the proposal, which comes less than two decades after they fought off attempts to build a nuclear power station in the same bay.

An opencast coal mine

Residents say the mine and associated HGV traffic would create huge levels of dust and noise pollution, as well as spoiling the area's unique views and damaging the tourism industry.

"I'm strongly opposed to coal anyway for environmental reasons – but if they are going to mine for coal, this is absolutely the wrong place" said the owner of a local café, nestling behind the sand dunes on Druridge Bay, about 800 metres from the proposed mine. She claims that around half of her customers said they would stop visiting the area if the coal mine goes ahead. A local crafter who makes mirror frames with driftwood from the beach, is also strongly opposed. "It's such a beautiful area. If it goes ahead I know it will affect the landscape for the rest of my life" she said.

The site is close to Cresswell Pond, designated as a protected Site of Special Scientific Interest (SSSI) and the National Trust owns a portion of the bay.

The area around the proposed mine is also home to five endangered bird species, including the Yellowhammer and the Lapwing. "An opencast coal mine at Druridge Bay would desecrate the local landscape, be a tragedy for the region's tourism and a disaster for the climate. Northumberland Council must reject this proposal" said a Friends of the Earth campaigner.

Save Druridge Bay

A spokesman for Save Druridge Bay said "people here know from bitter experience that far from creating jobs, open casting destroys wealth and livelihoods".

"The mine will be a gross intrusion in an unspoiled landscape that will threaten the Druridge hinterland with noise, dust and light pollution. The project will have an impact on all other economic activity in the area, especially the growing tourism industry and the economic development of surrounding villages and towns."

The group claims the mine also poses a threat to the thousands of birds, animals and plants that thrive in the unique landscape at Druridge.
It says that green energy and renewables are preferable to the coal Banks Mining proposes to mine and that coal is one of the biggest sources of UK carbon emissions.

Walk Northumbria

The following extract is from 'Walk Northumbria'.

During operations, the rights of way would have to be diverted but would be reinstated with (possible) additional links. The footpath running west from the dunes to the ruined chapel at Low Chibburn would be retained at all times. Bird sanctuaries would be untouched and would be enhanced once coal extraction was complete. Field boundaries would be returned to their original shape. Woodland would also be reinstated with native species in more natural plantings. Access to Druridge Bay would remain open.

The downside has to be the disruption, noise and dirt for the residents of Widdrington and the fact that the mining, if it goes ahead, is not due to be completed until 2026. The restoration work will not be finished until 2032.

Nature concern Northumberland

Our experts are not convinced by Environmental Impact Assessment (EIA) assurances that this proposed development will be free of any negative environmental impacts. We believe that the wetland areas particularly Cresswell Pond SSI are vulnerable as the mine workings are likely to result in the lowering of the water table and possible contamination of the water supply.

The proposed development may also disturb existing bird breeding sites particularly those of the extremely vulnerable Marsh Harrier, which is a recent coloniser of the wetland areas. The impact of any possible waste and discharge from this proposed development is particularly worrying as the whole coastal area is being considered for Marine Conservation Zone status.

This area is growing in popularity as a nature tourism destination with large numbers of people enjoying the wildlife and countryside. The proposed development might affect this growth as well as having an impact on residents and the local economy.

Cartographical skills checklist

GCSE Geography

Strategies for success in Paper 3

Skill	When covered	Context
Use Atlas maps		
Describe population distribution		
Describe transport networks		
Describe settlement layout		
Describe relief and drainage		
Analyse inter-relationships between physical and human factors		
Establish associations between patterns on thematic maps		
Use latitude and longitude		
Use four-figure grid references		
Use six-figure grid references		
Use and understand scale, distance and direction		
Measure straight and curved distances		

Use and understand gradient, contour and spot height		
Identify basic landscape features and describe their characteristics		
Identify major relief features		
Relate cross-sectional drawings to relief features		
Interpret patterns of relief, drainage, settlement, communication and land-use		
Interpret cross sections and transects of physical and human landscapes		
Describe the physical features of two of the following landscapes – coastlines, fluvial and glacial		
Infer human activity from map evidence, eg tourism		
Be able to compare maps		
Draw, label, understand and interpret maps		
Use and interpret ground, aerial and satellite photographs		
Describe human and physical landscapes from photographs		
Describe landforms, natural vegetation, land-use and settlement from photos		
Draw sketches from photographs		
Label and annotate diagrams, maps, graphs, sketches and photographs		

Graphical skills checklist

GCSE Geography

Strategies for success in Paper 3

Skill	When covered	Context
Line charts		
Bar charts		
Pie charts		
Pictograms		
Histograms with equal class intervals		
Divided bar graphs		
Scattergraphs		
Population pyramids		
Suggest appropriate skills for data		
Choropleth maps		
Isoline maps		
Dot maps		
Desire line maps		
Proportional symbols on maps		

Proportional flow lines		
Understand gradient, contour and value on isoline maps		
Interpret maps, graphs and charts noted above		

Numerical and statistical skills checklist

GCSE Geography

Strategies for success in Paper 3

Skill	When covered	Context
Understanding of number		
Area		
Scale		
Quantitative relationship between units		
Design fieldwork data sheets		
Collect data with understanding of accuracy		
Sample sizes		
Sampling procedures		
Control groups		
Reliability		
Proportion		
Ratio		
Magnitude		

Frequency		
Draw informed conclusions from numerical data		
Mean		
Median		
Range		
Quartiles		
Inter-quartile range		
Calculate percentage increase and decrease		
Use of percentiles		
Relationships in bivariate data		
Lines of best fit		
Trend lines		
Make predictions		
Interpolate		

Fieldwork examples

This resource is part of the Fieldwork toolkit that supports our GCSE Geography specification (8035) and sits alongside other resources in the Fieldwork ideas section.

It is important to remember that content from one part of the specification may be applicable to another part and can be examined through fieldwork in a location other than that specified. For example, there are tourism-related fieldwork opportunities evident in 3.1.3.4, Glacial landscapes in the UK, but these concepts can also be examined in coastal or other locations.

There are also opportunities to use content from parts of the specification at a different scale from that specified. For example, there are numerous urban field opportunities in 3.2.1, Urban issues and challenges, that can be investigated in urban areas that are not major cities within the UK.

Schools can base the fieldwork on the geographical concepts rather than the specified locations. Please refer to page 24 of the specification for the full fieldwork requirements.

Some fieldwork opportunities arising from the new specification

Unit Ref.	Unit Title	Background	Hypothesis/Question Concepts/Processes	Data Collection	Data Presentation
3.1.1.3	Weather hazards – an extreme weather event experienced in the UK.	An opportunistic fieldwork enquiry, as it can only take place when an extreme weather event occurs, eg great storm, drought, snowfall etc.	Weather hazard X has had an impact on (area name). What impact did weather hazard X have on (area name)?	• Photographs of impacts. • Questionnaires to local people to determine range and scale of impacts. • Interview responses. • Secondary data to	Map of area with located photographs annotated to show impacts. Notes added to provide details.

			• Economic impacts • Environmental impacts • Social impacts • Management strategies Students would not investigate all of the above; one or two concepts may be the actual focus of the enquiry.	confirm details of weather event.	
3.1.1.4	Climate change – alternative energy production.	Could be carried out at local street level looking at the number of solar panels on houses within a locality.	The local community in area X is helping to reduce the cause of climate change. How is the local community in area X helping to reduce the cause of climate change? • Sustainable energy • Renewable energy	• Using local street maps, record the number of solar panels evident on individual buildings. • Interview people who have solar panels to see how much energy they generate.	Locate results on a base map at street level; use proportional symbols to represent numbers of solar panels. Additional symbol(s) for energy data. GIS opportunity.
3.1.1.4	Climate change – changing agricultural systems.	Could be carried out in a rural area or even on a city farm or market garden.	Agriculture is changing to reduce the causes of climate change. How is agriculture changing to reduce the causes of climate change? • Inputs (focus on changes)	• Interview with farmer to determine changes made recently, specifically aimed at reducing causes of climate change. • Secondary data provided by farmer and/or internet search.	Map of farm annotated to show changes made. GIS opportunity. Graphs of changes to inputs, outputs, processes.

			• Outputs (focus on changes) • Processes (focus on changes)		
3.1.1.4	Climate change – reducing risk from rising sea levels.	Could be undertaken in a location where action has already been taken to reduce risk. It could also take place in an area at risk where plans are in place to reduce the risk of rising sea levels.	Area X has responded to the risk of rising sea levels. How has area X responded to the risk of rising sea levels? • Rising sea level • Hard engineering • Management	• Site visit, mapping and photographing strategies put in place (possibly evaluating these strategies). • Secondary data re: flood risk, previous floods. • Interviews with planners/residents.	Mapping of strategies, with photographs and notes. Evaluation data added. GIS opportunity.
3.1.2.1	Ecosystems – small scale ecosystem.	Could be a deciduous woodland, pond, heathland, hedge row.	The ecosystem at X is healthy and balanced. How healthy is the ecosystem at X? • Ecosystem • Producers • Consumers • Decomposers	• Quadrat sampling on land to determine features of ecosystem. • Sampling by dipping in ponds. • Recording species and numbers at site(s) used.	Graphs of species numbers looking at ratios of producers to consumers to decomposers.
3.1.3.2	Coastal landscapes – wave types and characteristics.	Could be extended to look at coastal processes and landforms. Possible links to geology can be developed.	The dominant waves at X are constructive (destructive). What types of waves occur at X?	• Wave counts at a range of locations. • Measurements of wind speed and direction.	Proportional arrows representing average wave frequency located onto a base map of the study area. Direction of arrow in line

			• Constructive waves • Destructive waves • Any other coastal processes relevant to the location, eg longshore drift, erosion, deposition		with prevailing wind. Wind strength can be shown with additional symbol or raw data added.
3.1.3.2	Coastal landscapes – mass movement and its impacts.	Could be carried out along any section of coastline where mass movement is occurring and fieldwork can be undertaken safely. Possible links to geology can be developed.	Mass movement has had significant impacts on the coast at X. What impact has mass movement had on the coast at X? • Mass movement • Slumping • Land use	• Photographs/sketches of mass movement. • Measurement of cliff profiles – heights and angles. • Land use survey of area affected by mass movement.	Annotated photographs or sketches of mass movement events. These can be located on a base map and/or geological map of location with land use identified to illustrate impact of cliff retreat.
3.1.3.2	Coastal landscapes – erosion and its impacts.	Could be carried out along any stretch of coastline where erosion is taking place and data collection can be carried out safely. Possible links to geology can be developed.	Erosion is changing the coastline at X. How is erosion changing the coastline at X? • Abrasion • Attrition • Erosion Hydraulic action has not been identified as a key term as it is so difficult to measure in the field.	• Photograph or sketch evidence of erosion, eg undercutting of cliffs, landforms such as stacks and arches. • Measure extent of wave-cut platforms. • Measure changes in size of beach material.	Annotated diagrams or photographs of erosional landforms, possibly with measurements added. Proportional symbols on maps to show changes in size of beach material.

3.1.3.2	Coastal landscapes – longshore drift.	Could be carried out along any beach where data collection can be carried out safely. Could be developed to include the study of landforms created by deposition.	Longshore drift moves beach material North-South or West-East along the beach at X. In what direction does longshore drift move beach material at X? • Longshore drift • Constructive waves • Destructive waves • Fetch	• Use orange or tennis ball to measure distance of longshore drift in 2 minutes (or as long as you wish) along a stretch of beach. Repeat as often as required. • Measure drop in height to beach level either side of groynes if these are present. • Count wave frequency at locations along the beach. • Determine wind and wave direction.	Use proportional arrows on base map of beach to show direction of longshore drift and distance covered by orange or tennis ball at each location used. Draw bars to show change in height either side of groynes and colour code based on side of groynes where data were collected. Add proportional arrows to the sea at each location to show wave frequency and direction. Add wind speed and direction using wind rose. GIS opportunities.
3.1.3.2	Coastal landscapes – hard engineering and/or soft engineering and/or managed retreat.	It is possible to look at just one of these strategies, or cover more if the opportunity arises.	The coastal management strategy (strategies) at X is (are) effective. Is (Are) the coastal management strategy (strategies) at X effective? • Hard engineering • Soft engineering • Managed retreat.	• Take photographs and map strategies. • Use EQS type of scoring system to assess effectiveness. • Measure cliff profiles to assess stability. • Look at vegetation coverage on cliff profiles to assess stability. • Measure sediment	Located photographs and graphs on base maps. Well annotated photographs of cliff profiles. Scale drawings of cliff profiles. Graphs of sediment accumulation at groynes.

			Possibly linked to: • Erosion • Mass movement • Longshore drift.	accumulation at groynes to assess success in reducing longshore drift. • Secondary data indicating rate of coastal change and need for management.	GIS opportunities.
3.1.3.3	River landscapes – long profile.	Changes along the long profile of a river need not involve using locations from source to mouth. Any sections of a river that are safe, accessible and show change over distance can be used.	Changes in river features and/or characteristics and/or processes can be found over distance on the River X. What changes in river features and/or characteristics and/or processes can be found over distance on the River X? • Long profile • Gradient • Velocity • Bedload • Cross profile • Erosion • Deposition There is no need to address all of these concepts/processes, just two	• Determine gradient from OS map evidence or in the field using clinometers. • Velocity using floating object or hydroprop. • Bedload size and/or shape, possibly using Powers Index. • Width and depth for cross profile. • Evidence of erosion – bank undercutting, collapse, river cliffs, changes in bedload size and/or shape. • Deposits of sediment mapped.	Long profile drawn to scale for section(s) of river studied. Located graphs added to long profile to identify features/ characteristics. Cross profiles drawn to scale. Proportional symbols for bedload and velocity. Dispersion graphs for bedload. Scatter of bedload against velocity.

			would suffice. Possibly link to establish theories of rivers.		
3.1.3.3	River landscapes – cross profile.	Changes along the cross profile of a river need not involve using locations from source to mouth. Any sections of a river that are safe, accessible and show change can be used.	Changes in the cross profile of the River X occur along its course. What changes in the cross profile of the River X occur along its course? • Cross profile • Gradient • Velocity • Bedload • Long profile • Erosion • Deposition There is no need to address all of these concepts/processes, just two would suffice. Possibly link to establish theories of rivers.	• Width and depth for cross profile. • Velocity using floating object or hydroprop. • Bedload size and/or shape, possibly using Powers Index. • Evidence of erosion – bank undercutting, collapse, river cliffs, changes in bedload size and/or shape. • Deposits of sediment mapped.	Cross profiles drawn to scale. Proportional symbols for bedload and velocity. Dispersion graphs for bedload. Scatter of bedload against velocity.
3.1.3.3	River landscapes – flood management	In cities such as York, frequent flood events have resulted in flood management schemes being introduced. There is	The flood management scheme in X has been effective. How effective has the flood	• Secondary data re: previous flood events covering frequency, extent and impacts. • Mapping of features of	Mapping of extent of flood events. Graphs of frequency of flood events.

	scheme.	an opportunity here for physical and human geography data to be collected.	management scheme at X been? • Flood events • Impacts (social, economic, environmental) • Management	flood management scheme. • Photographs and assessment of features mapped. • Questionnaires to local people assessing effectiveness. • Secondary data of frequency, extent and impacts of flood events since management scheme introduced.	Graphs/maps of impacts. Mapping and photographs with assessments of features of flood management scheme. Questionnaire responses presented graphically.
3.1.3.4	Glacial landscapes – land use, conflicts, development, conservation.	Starting an enquiry in a glacial area with land use is quite straightforward and then it is relatively easy to develop the enquiry to examine other aspects of the specification such as those noted.	The glacial landscape at X provides a range of land use opportunities. What are the land uses within the glacial landscape at X? Can develop this to look at how land use links to conflicts, how development of land uses create conflicts and how conservation can be achieved even with current and planned land uses.	• Map land uses within study area. • EQS style of data collection re: positive/ negative impacts and photographs for supporting evidence. • Questionnaires to local people re: issues and conflicts. • Photographic evidence of conflicts. • Mapping of developments and conservation strategies. • Secondary data relating to developments and	Maps of land use possibly enhanced with photographs and EQS results. Graphs of questionnaire responses. Conflict matrix. Written or photographic evidence of development and/or conservation strategies.

			• Land use • Conflicts • Development • Conservation	conservation.	
3.1.3.4	Glacial landscapes – tourism, attractions, impacts, management strategies.	It is important to note that the tourism content specified can also be applied to coastal areas, cities, honeypot sites etc, and does not have to be studied within the context of a glacial landscape.	The glacial landscape at X provides a range of attractions for tourists. Why do tourists visit the glacial landscape at X? This can be extended or adapted to examine impacts of tourism (social, economic, environmental) and/or management strategies. • Tourism • Attractions (physical and/or human) • Impacts (social, economic, environmental) • Management strategies	• Questionnaires to visitors to determine reasons for visiting area (attractions). • Mapping of attractions. • EQS style assessment of attractions. • Questionnaires to locals to determine impacts of tourism. • Traffic flow data. • Land use survey. • House price survey. • Secondary data. • Mapping/photographs of management strategies.	Mapping of attractions possibly enhanced with photographs and/or EQS data. Graphs for questionnaire responses. Proportional flow lines for traffic data. Land use map. Graphs for house prices. Maps with photographs and notes indicating management strategies.
3.2.1	Urban issues and challenges – migration.	Could look at reasons for migration and impacts of this process.	Migration has had a range of impacts on X. What impact has migration had on X? • Migration	• Secondary data to establish rates of migration. • Questionnaires to determine reasons why people have moved into the locality and to find	Graphs showing rates of migration. Choropleth maps to show source of migrants. Graphs showing reasons for

			• Economic impacts • Social impacts • Environmental impacts	out where they have come from. • Land use surveys to determine impacts of migration, eg restaurants, specialist food/clothing outlets, places of worship etc. • Photographs of environmental impacts. • Questionnaires looking at social impacts.	migration. Land use maps of functions linked to migration. Annotated photographs.
3.2.1	Urban issues and challenges – recreation and entertainment.	Could look at how provision for recreation and entertainment has been increased using an urban area that has undergone change.	Change to the urban area of X has increased opportunities for recreation and entertainment. How has change to the urban area of X increased opportunities for recreation and entertainment? • Recreation • Entertainment	• Secondary data to research planning ideas underpinning urban change. • Land use mapping of recreation and entertainment options, noting recent changes. • Photographs of recreation and entertainment provision. • Questionnaires to determine opinions about recreation and entertainment provision.	Land use maps showing recreation and entertainment provision, colour-coded to indicate when established. Annotated photographs to show main features of recent provision. Graphs to show views about the recreation and entertainment provision.
3.2.1	Urban issues and challenges	Contrasting housing areas within an urban locality can be compared. A minimum of	Inequalities in housing exist in X	• Secondary data re: ratio of owner-occupied to rental properties in	Graphs of ratio of owner-occupied to rental properties.

	– housing inequalities.	two such areas should be used but students could investigate several areas if time allows.	How is housing inequality evident within X? • Housing inequality • Owner-occupied • Rental properties • Property values • Environmental quality	locality. • Secondary data re: housing quality information, eg number of toilets etc. • EQS style assessment of housing quality. • Photographs to support EQS data. • Property price surveys, online or through press or estate agents. • EQS of locality.	Graphs to show differences in housing quality information. Mapping of relative housing qualities to determine zones with marked differences. Well annotated photographs to show inequalities. House price graphs.
3.2.1	Urban issues and challenges – urban regeneration.	Could be undertaken in any urban area where some form of regeneration has taken place.	The regeneration of X has had a positive impact on the locality. What impact has the regeneration of X had on the locality? • Regeneration • Environmental impacts • Economic impacts • Social impacts	• Secondary data to examine reasons for regeneration and to establish before and after information about the locality. • EQS of regeneration area and neighbourhood adjacent to it with photographs for supporting evidence. • Land use mapping to determine new businesses brought into regenerated area. • Questionnaires to determine social impacts	Before and after photographs and maps of locality. EQS mapped to show changes from regenerated area to neighbouring area. Land use maps of businesses. Graphs of questionnaire responses re: social impacts.

				of regeneration.	
3.2.1	Urban issues and challenges – transport strategies.	All urban areas have policies and strategies for managing transport within their locality and these can be studied at a range of scales, from examining the effectiveness of a Park and Ride scheme to looking at an integrated transport scheme in a city.	The transport strategy in X is effective. How effective is the transport strategy at X? Key concepts will depend upon which aspect(s) of the transport strategy will be investigated. • Transport strategy • Integrated transport scheme • Park and Ride • Traffic calming • Traffic management	• Secondary data to establish strategy being promoted by urban area involved. • Mapping of features of strategy, eg bus lanes, cycle lanes, exclusion zones, linked features in integrated scheme. • Traffic flow counts. • Surveys at Park and Ride site to determine usage. • Questionnaires regarding effectiveness of transport strategy.	Maps of key features of strategy. Linked features shown on map. Proportional flow lines of traffic movements. Graphs for questionnaire responses re: effectiveness of strategy.
3.2.2	The changing economic world – development of science and business parks.	There are over 100 science and business parks in the UK so access to one such site should be possible for most schools without having to travel too far.	The science/business park at X has had a positive impact on the locality. What impact has the science/business park had on the locality at X? • Science park • Business park • Multiplier effect • Economic impacts	• Secondary data to determine background to development of science/ business park. • Land use survey. • Interviews with business to find reasons for locating there, employee numbers, links to other businesses. • Secondary data for economic impact of park.	Map of site classifying businesses by function. Graphs of data from interviews, eg numbers of employees. Economic value of park over time. Located graphs for EQS results.

			• Environmental impacts	• EQS style assessment of environmental impacts.	
3.2.2	The changing economic world – population change in a rural area.	Some rural settlements are expanding whilst others are declining. Rates of change and reasons for these changes can form the basis of an enquiry.	The population of X has declined/increased because of economic factors. Why has the population of X declined/ increased? • Population change • Migration • Economic factors • Function • Services	• Secondary data to determine population change over time. • Questionnaires to residents to establish reasons for movement into/out of the settlement. • Housing surveys to record age and price. • Research transport links. • Mapping of functions and services found in the settlement.	Graph of population change, possibly annotated with explanations for periods of increase/decrease. Graphs for reasons residents moved into/out of the settlement. Map of housing areas with age and price added. Map of functions and services within settlement and distances to nearest options of those lacking, eg doctor, primary school, petrol station.
3.2.3.1	Resource management – carbon footprints, food miles.	Could be carried out individually and, if appropriate, data collated and shared to widen sample size.	People in X create a large carbon footprint. People in X could reduce the food miles of their weekly shop. What is the carbon footprint of people living in X?	• Use online calculator to determine carbon footprint of each students' family and compare results. • Collect data about their family's energy use, transport, food, clothing, tv and phone use etc. • Identify 10 (or more)	Graphs of carbon footprints for: • Individual families based on separate contributing factors, eg energy • Class data sets based on family size. Choropleth or proportional flow lines maps to show

			How could people in X reduce the food miles of their weekly shop?	examples of foods originating from outside of the UK and the same number produced within the UK at each student's home. • Use online calculator to determine food miles for wide range of food products. • Surveys in supermarkets to examine range of foods available and calculate food miles for sample of foods from outside of the UK and for similar foods produced within the UK.	food miles involved for range of regular purchases for individual families based on whole class data.

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